1. it is a molecular orbital ✓

2. 3 hybrid orbitals ✓

3. The geometry of the molecule will be trigonal bypyramidal ✓

4. $\pi$ bonds concentrate electron density off the internuclear axis ✓

5. a. $\sigma$ bond ✓
   b. $\sigma$ bond ✓
   c. $\pi$ bond ✓

$\frac{18}{19} = 95\%$

6. As: 33 electrons F: 9 electrons C: 6 electrons Sn: 50 electrons

As and Sn ✓ ✓ could have the hybridizations stated in the question

7. there are 2 ~~$\sigma$~~ bonds in a triple bond ✗ -1 10$\sigma$, 2$\pi$ bonds

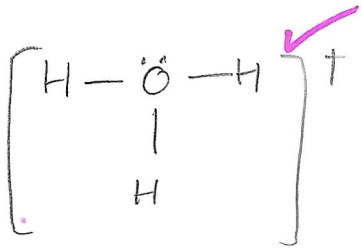
8. The colors of visible light will be; red, orange, green, blue, indigo, and violet. ✓ All of the colors of light will appear except of yellow

9. a. The carbon atom in benzene will have an $sp^2$ ✓ hybridization

   b. There are 12 $\sigma$ ✓ bonds

   c. There are 3 $\pi$ ✓ bonds

10.

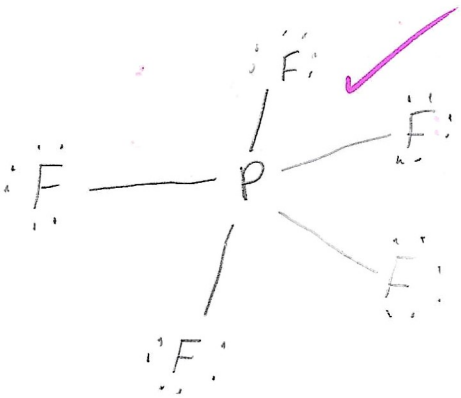


8E → 4 orbitals

hybridization: $sp^3$

geometry: Pyramidal

11.

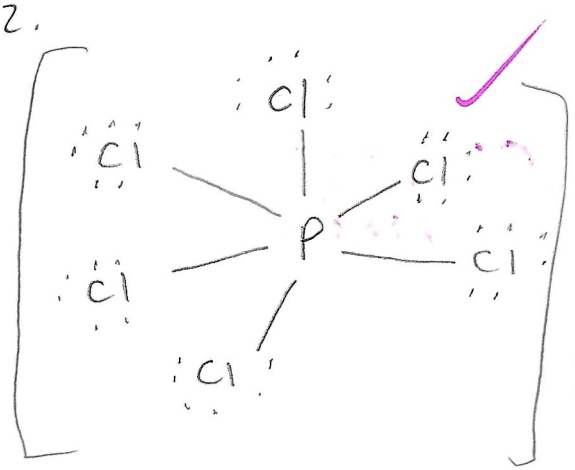


10E → 5 orbitals

hybridization: $sp^3d$

geometry: Trigonal bipyramidal

12.



12E → 6 orbitals

hybridization: $sp^3d^2$

geometry: octahedral